TAINET

Scorpio 1400 A/D/G

G.SHDSL Termination Unit

User's Manual

The Professional Partner

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ABOUT THIS MANUAL

This section guides you on how to use the manual effectively. The manual contains information needed to install, configure, and operate TAINET's SCORPIO 1400 termination units. The summary of this manual is as follows:

Chapter 1: INTRODUCTION
Describes SCORPIO 1000 and how to use SCORPIO 1400 in several applications.

Chapter 2: SPECIFICATIONS
Describes the features, specifications and applications of SCORPIO 1400.

Chapter 3: INTERFACING
Introduces all the interfaces, including front panel and rear panel.

Chapter 4: INSTALLATION
Step-by-step guide to assist user to install and verify the SCORPIO 1400.

Chapter 5: OPERATION OF CID
Gives a description of the CID (Craft Interface Device).

Appendix A: ORDER INFORMATION
Describes all the SCORPIO 1400series products.

Appendix B: VT-100 MENU TREE
Describes theVT-100 menu tree.

Appendix C: PIN ASSIGNMENT
Describes all cables and connectors with pin definition.

Appendix D: TROUBLE SHOOTING
Provides brief trouble shooting list.

Appendix E: TROUBLE REPORT
Trouble Report Form

Appendix F: GLOSSARY

SYMBOLS USED IN THIS MANUAL

3 types of symbols are used throughout this manual. These symbols are used to advise the users when a special condition arises, such as a safety or operational hazard, or to present extra information to the users. These symbols are explained below:

Warning:
This symbol and associated text are used when death or injury to the user may result if operating instructions are not followed properly.

Caution:
This symbol and associated text are used when damages to the equipment or impact to the operation may result if operating instructions are not followed properly.

Note:
This symbol and associated text are used to provide the users with extra information that may be helpful when following the main instructions in this manual.

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1 INTRODUCTION

ABOUT THIS CHAPTER

This chapter begins with a general description of SCORPIO 1000 (S1000), which is a high-density universal rack mounted system. Then, the chapter describes how to use TAINET SCORPIO 1400 (S1400) in several applications and show the possible interface configurations of S1000/S1400 System.

Overview

DSL (Digital Subscriber Loop) technologies increase the bandwidth capacity of existing ubiquitous telephone line (the local copper loops). G.SHDSL is designed for business applications, where high speed is required in both transmission directions. It provides symmetrical data rates of 192Kbps to 2.304Mbps with a transmission distance up to 20Kft using SHDSL technology. The speeds obtainable using DSL technologies are tied to the distance between the customer premise and the Telco central office. Performance varies with loop characteristics, such as line conditions, loop distance, wire gauge, noise, and the number and locations of bridged taps and gauge changes. The G.SHDSL bit rate can be configured (or rate adapted) to adapt to the line conditions.

The SCORPIO 1000 (S1000) provides full coverage of the Last Mile with a variety of technologies, rates, interfaces and media. The system supports standard technologies such as G.SHDSL. Each card in the S1000 is in a point-to-point configuration opposite to a remote unit with no connection to the adjacent cards. This allows totally independent operation among the ports and cards on the S1000. Three types of technologies will be provided in S1000: 2-wire G.SHDSL modems, 4-wire G.SHDSL modems, and fiber optic modems.

S1000 is a high-density universal rack mounted system. The chassis has 14 slots that accommodate up to 14 modems, or 28 modems if dual-port cards are used. Using modular interface cards, S1000 can support SHDSL or fiber in the same chassis under a single management system.

Its hot-swappable feature allows any card or cable to replaced or removed during equipment operation, without causing interference to data transmission to / from other cards in the chassis.

Modular data interfaces allow modem connectivity via a wide range of DTE interfaces. These interfaces include T1, E1, DATA (V.35, V.36 / RS449, X.21, RS-530), and Ethernet.

Applications

The SHDSL System consists of a central unit, STU-C (SHDSL Transceiver Unit - Central), at central office, and a remote unit, STU-R (SHDSL Transceiver Unit - Remote), at customer premises.

The services are extended through the ubiquitous copper wires or leased lines with the technologies of G.SHDSL or fiber. Various interface extensions are supported: E1, T1, DATA (V.35, V.36 / RS449, X.21, RS-530) , and Ethernet.

Figure 1-1 and *Figure 1-2* show two typical application. *Figure 1-3* depicts the possible interface configurations.

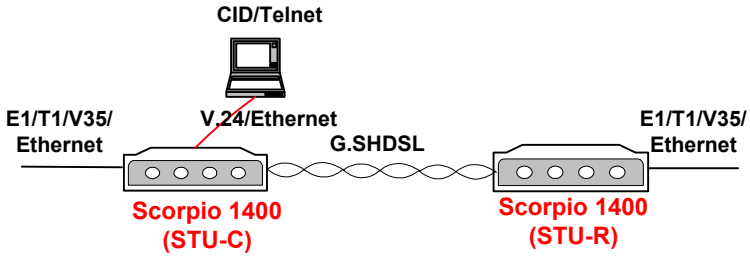


Figure 1-1 **Application of Back-to-back**

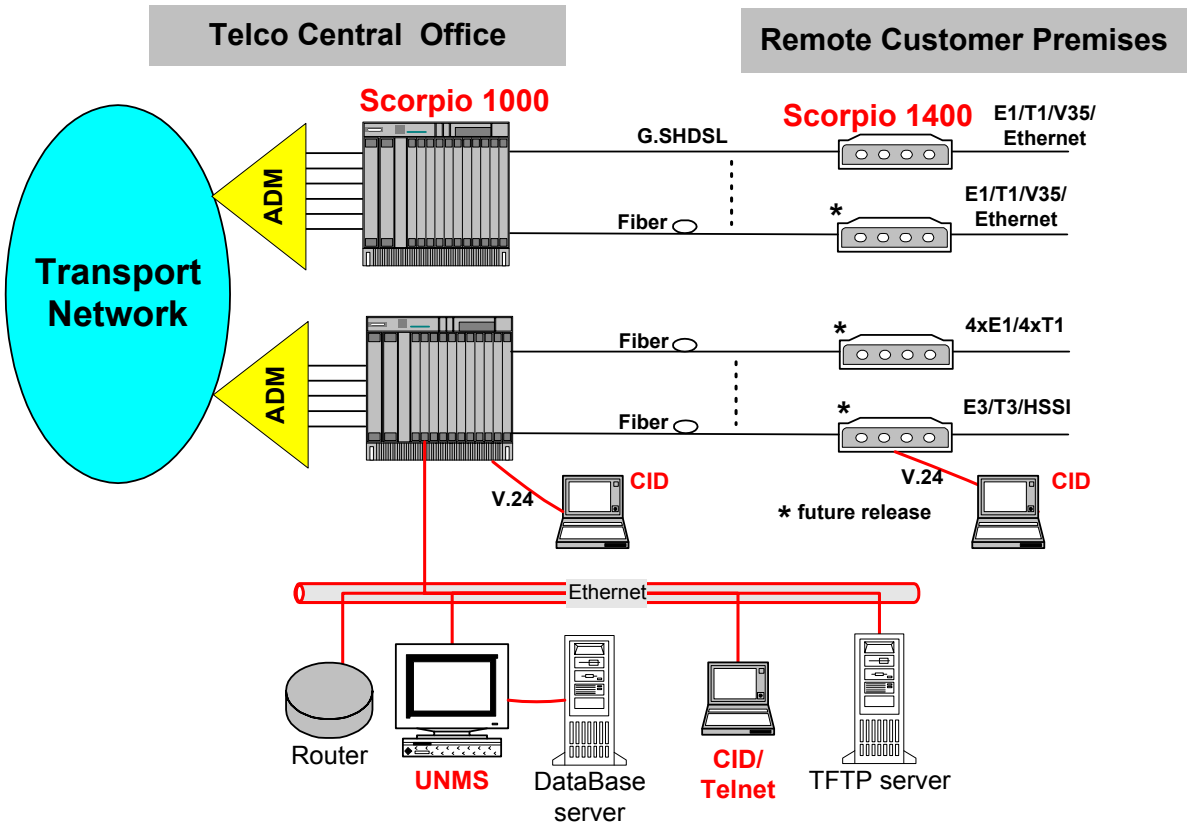


Figure 1-2 **Application of S1000/S1400 System**

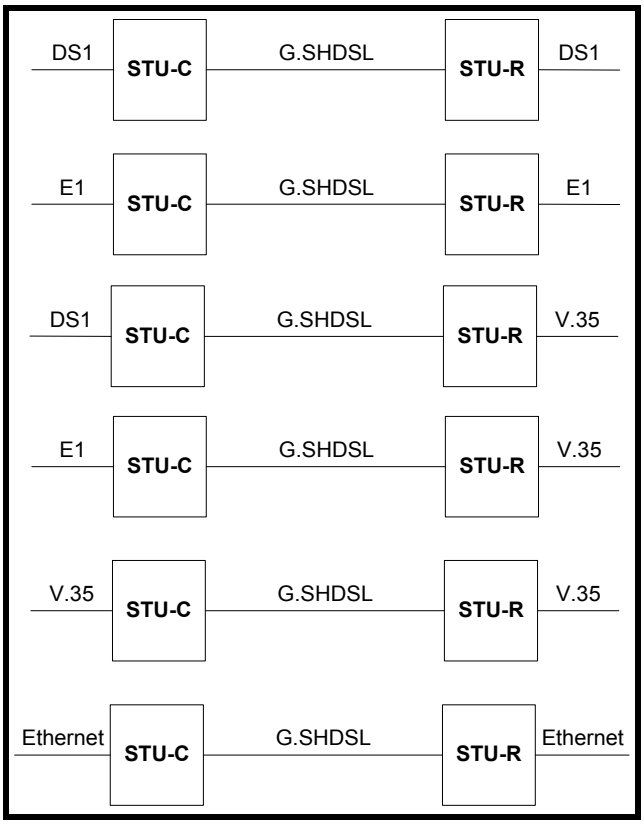


Figure 1-3 **Possible Interface Configuration of S1000/S1400 System**

Note that SCORPIO 1400 (S1400) can be configured as STU-C or STU-R, whereas S1400 should be an STU-R when connected with S1000.

2 SPECIFICATIONS

ABOUT THIS CHAPTER

To let the user understand the TAINET SCORPIO 1400, this chapter begins with its main features. Then, the chapter continues to present the SHDSL interface, the network side interface, timing and synchronization, OAM (Operation, Administration and Maintenance) and technical specifications. The last part of this chapter is devoted to the applications of TAINET SCORPIO 1400 family in different networks, which include cellular network, campus network and E1 network.

Main Features

Listed below are the main features of the SCORPIO 1400:

- Support loop interface G.SHDSL and fiber (in near future)
- S1400A supports DTE interface: T1, E1, DATA (V.35, X.21, RS-530, V.36 / RS449)
- S1400R supports Ethernet interface
- Carrying symmetrical 2048 Kbps payload for up to 2.4 miles / 3.9 Km over 26-AWG single pair copper wire
- Automatic line rate selection according to DTE data rate (Nx64Kbps)
- Support SHDSL payload rates of n ×64Kbps, where n is 3 to 36
- Support Timing and Synchronization: Local (internal) timing , Line timing (loop received clock), DTE timing
- For test and diagnostic purpose the S1000 / S1400 system provides various loopback paths including ITU-T V.54 in-band activated and deactivated loopback code words for end-to-end loopback function
- Management by UNMS (via S1000) or CID
- Remote control / monitoring via Telnet and Ethernet
- Remote in-band control / monitoring CPE via G.SHDSL EOC
- Remote software upgrade via TFT

SHDSL Interface

- Meet ITU-T G.991.2 relative requirements
- Support **Wetting Current** function for feeding of a low current （between 1.0 mA and 20 mA）on the pair to mitigate the effect of corrosion of contacts.
- Support power **back off** functions
- Data rate of 192K to 2.304M bps (incrementing step: 64K bps)
- Modulation Method: 16-TCPAM (16 levels Trellis Coded Pulse Amplitude Modulation).
- Physical Connection Type: Standard RJ-45 jack, 135 ohm balanced via 2 wire twisted pair
- Port enabled / disabled configurable

Network Side Interface

DS1 Interface

- Bit Rate: 1,544 Kbit / s ± 32 ppm.
- Frame Format: SF (D4), ESF, ESF+CRC, or Unframed, field selectable.
- Line Code: AMI or B8ZS, field selectable.
- Impedance: Nominal 100 ohms ± 5% resistive, symmetrical pair.
- Jitter performance: Meet ITU-T G.824 requirements.
- Physical Connection Type: Standard RJ-48C / RJ45 jack.

E1 Interface

- Comply with G.703 Standard.
- Bit Rate: 2,048 Kbit / s ± 50 ppm.
- Frame Format: Unstructured or Structured framing, field selectable
- Line Code: High Density Bipolar of Order 3 (HDB3).
- Impedance: Nominal 120 ohms ± 5% resistive, symmetrical pair.
- Jitter performance: Meet ITU-T G.823 requirements.
- Line Interface: 120 ohm (RJ-45 / RJ48C) balanced or 75 ohm (BNC) unbalanced, selectable.
- Physical Connection Type: Standard RJ-48C/RJ45 jack (Balance) or BNC (Unbalance).

V.35 Interface

- Electrical Characteristics: Comply with ITU-T V.35 interface.
- Software configurable for V.35, X.21, RS530, V.36/RS-449.
- Data Rate: n x 64 Kbit / s, where n = 1~36.
- Data inversion selectable.
- Clock inversion selectable.
- Physical Connection Type: The pin assignment of ITU-T V.35 interface comply with 34-pin ISO 2593 connector.

Timing and Synchronization

Table 2-1 shows three modes to be field selectable.

Table 2-1 Timing and Synchronization

Mode Number	*STU-C Symbol Clock Reference*	*STU-R Symbol Clock Reference*	*Example Application*	*Mode*
1	Local oscillator (internal timing)	Received symbol clock	"Classic" HDSL	Plesiochronous
2	Transmit data clock (DTE timing)	Received symbol clock	Main application is synchronous transport in both directions.	Synchronous
3	Transmit data clock (DTE timing)	Received symbol clock	Synchronous downstream transport and bit-stuffed upstream is possible.	Hybrid: downstream Synchronous upstream: Plesiochronous

OAM

OAM (Operation, Administration and Maintenance) of the SCORPIO 1400 is listed below:

- UNMS manages S1000 system via SNMP interface and provides a user-friendly GUI-based operational interface under PC / Windows or HP OpenView systems.
- Support standard MIB RFC 2495 for DS1 / E1, and RFC3276 for SHDSL interface
- CID Console: user-friendly menu-driven operation
- SNMP management message interface
- Remote control / monitoring S1000 via Telnet and Ethernet
- Remote in-band control/monitoring CPE via G.SHDSL EOC
- Remote Software Upgrade: Remotely via Ethernet port with TFTP protocol, Locally CID console terminal with XMODEM protocol
- Automatically and manually configuration backup and restoration to / from local nonvolatile memory
- Support default configuration setup
- Support Alarm Surveillance function
- Support Performance Monitoring function
- For test and diagnostic purpose the S1000 / S1400 system provides various loopback paths, which are depicted in *Figure 5-1* and *Figure 5-2*
- For each STU-C and STU-R, the built-in PRBS generation and detection are provided for loopback performance test on per channel basis. Test results are displayed. The supported PRBS patterns include 2^{11}-1, 2^{15}-1, 2^{20}-1, QRSS, 2^{20}-1, 2^{23}-1
- ITU-T V.54 in-band activated and deactivated loopback code words are provided for end-to-end loopback function, the details are depicted in *Figure 5-3*.

Technical Specifications

Table 2-2 gives the technical specifications of the SCORPIO 1400.

Table 2-2 Technical Specifications of the SCORPIO 1400

DSL		
Modulation	PAM	
Mode	Full duplex with echo cancellation	
Number of loops	Single	
Loop rate	N*64+8 K (N=3~32) and 2320Kbit / S	
Data rate	64K to 2048Kbit/S and 2304Kbit/S	
Loop impedance	135 ohms	
Clock source	Internal clock / DTE clock / Receive clock	
Clock accuracy	± 32 ppm	
Interface		
Module	***Data***	
	V.35 Nx64 Kbps interface RS-530 Nx64 Kbps interface V.36 Nx64 Kbps interface X.21 Nx64 Kbps interface	
	E1/T1	
	E1 G704 / G704 interface T1 interface	
Diagnostics		
Loop test	**LL**	: Local loop back
	RL	: Remote Loop Back
	LPL	: Payload Loop Back
	RPL	: Remote payload Loop back
Status Indicators	**PWR**	: Power indicator
	SHDSL	: DSL status indicator
	DTE	: Data/E1/T1 interface
	ALM	: Alarm indicator
	TST	: Test status indicator
Craft port	115200 BPS 8 bit data length	

	None parity 1 stop bit 9-pin/D-sub/female connector
Ethernet port	10M BPS RJ-45 jack
Power Requirement	
Input	AC Power adapter 110/220 VAC ± 10 % DC Power adapter 36~72 VDC
Power Consumption	< 12 W
Environments	
Temperature	Operating +0℃ ~ +50℃ Storage -40℃ ~ 70℃
Humidity	Operating 10% ~ 80% non-condensing Storage 5% ~ 90% non-condensing

Applications

This section describes how to apply TAINET SCORPIO 1400 family in different network systems, which include cellular network, campus network and E1 network.

Cellular network

The cellular network user will need to lease larger numbers of E1 circuits in order to connect remote cell sites to mobile telephone switching offices (MTSOs). TAINET SCORPIO 1400 provides an alternative to standard repeater E1 service. *Figure 2-1* shows a cellular network application.

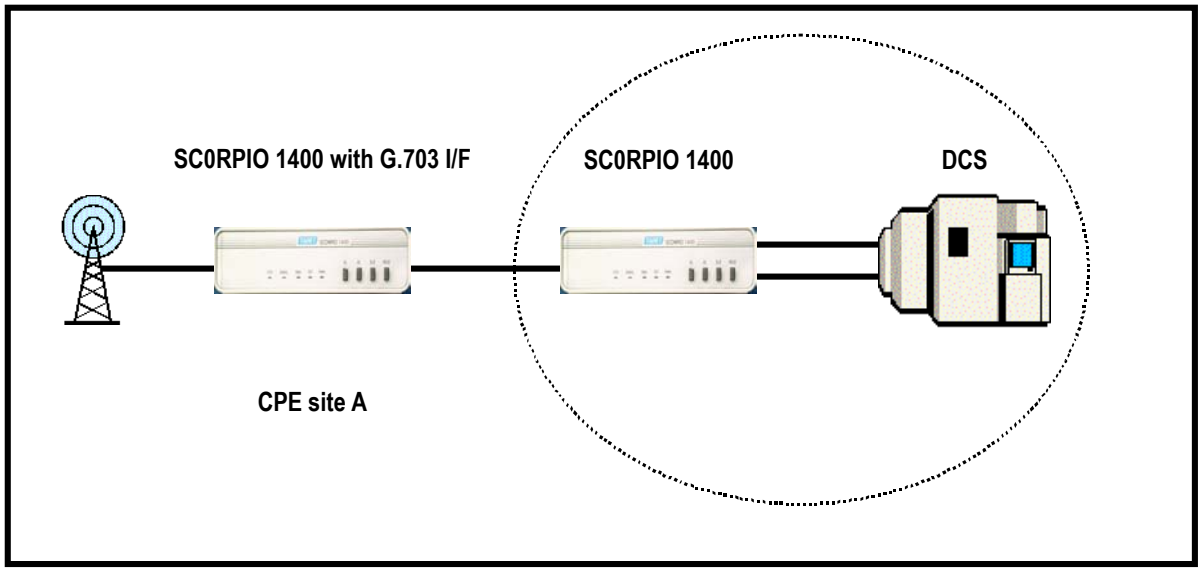


Figure 2-1 **LAN to LAN Interconnection over ATM Network**

Campus network

The SCORPIO 1400 is well suited to the campus applications. *Figure 2-2* and *Figure 2-3* show two general campus applications where remote PBX or routers are interconnected across a campus using two SCORPIO 1400. One unit is configured as a central office site (CO) unit and the other is the customer premise equipment (CPE) unit.

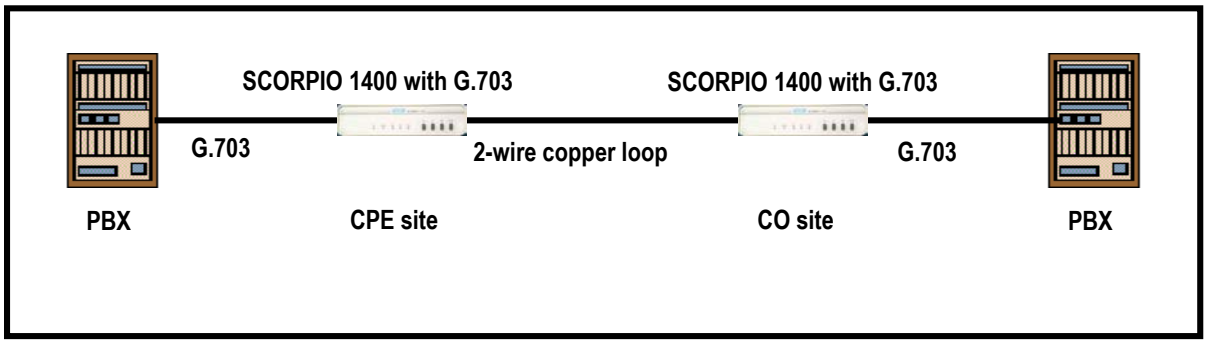


Figure 2-2 Campus Network Application of the SCORPIO 1400 with G.703 I/F

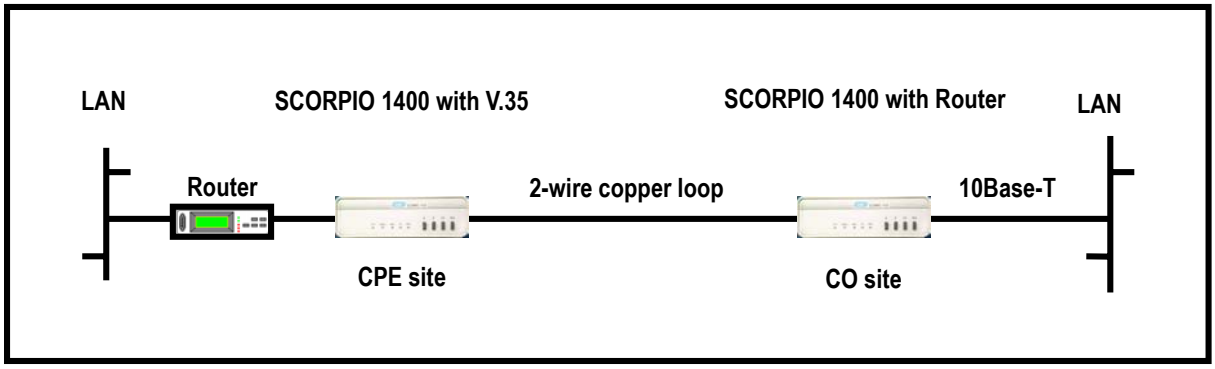


Figure 2-3 Campus Network Application of the SCORPIO 1400 with V.35 I/F

Each SCORPIO 1400 is configured at the factory to operate on the CO side of an E1 connection. However, you can easily modify settings intended for the CO into settings for CPE.

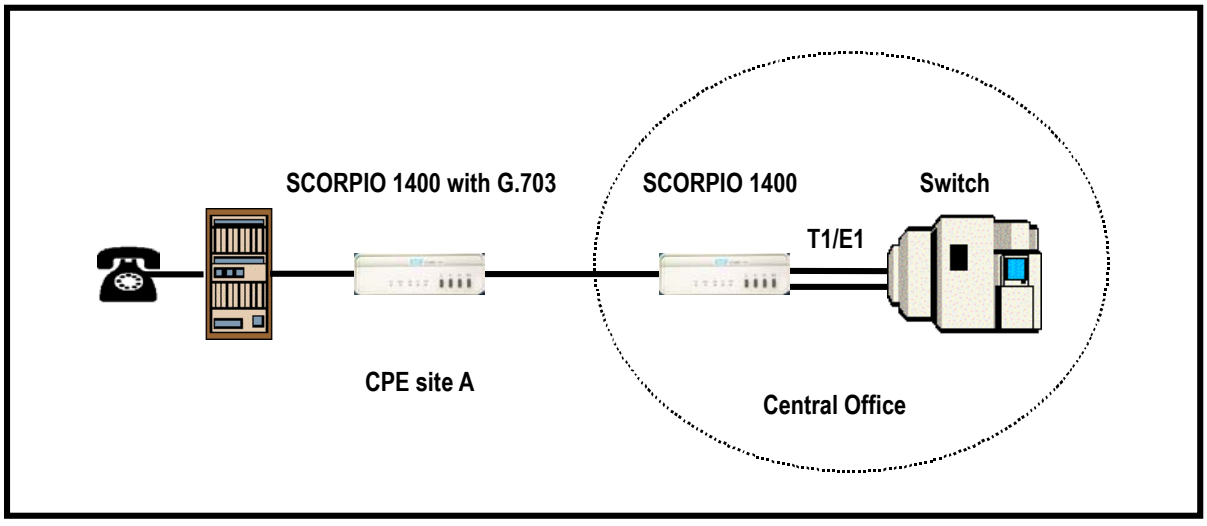


Figure 2-4 E1 Application of the SCORPIO 1400 with G.703 I/F

E1 Network

The SCORPIO 1400 can be deployed to replace traditional E1 network, without the repeater in the E1 network and effectively doubling the utilization of the existing twisted copper pair. *Figure 2-4* shows a general E1 network.

3 INTERFACING

ABOUT THIS CHAPTER

In this chapter, we will focus our attention on the interfaces of the SCORPIO 1400. First, the front panel of the SCORPIO 1400 will be discussed. After that, we will examine in more detail the rear panel of the SCORPIO 1400.

Front Panel

The front panel of SCORPIO 1400, as illustrated in *Figure 3-1*, contains two main sections, i.e. the status indicators and the test buttons. Via the front panel of SCORPIO 1400, users can perform the functions as listed below:

- displaying system status
- setting loopback test

From the status indicators of front panel, users can obtain useful information to monitor the status of the SCORPIO 1400. In addition, users can set some loopback tests by pressing the test buttons on the front panel.

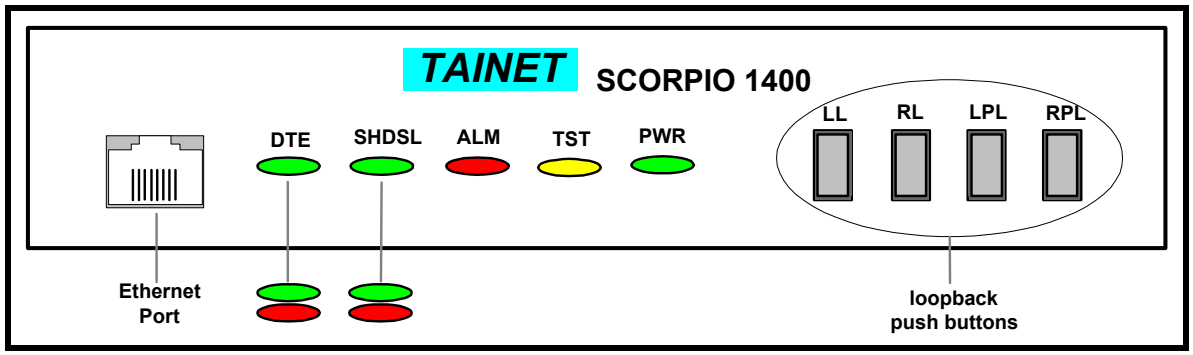
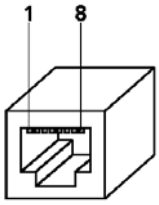


Figure 3-1 **Front Panel of the SCORPIO 1400**

Status Indicators

The status indicators of the SCORPIO 1400 are depicted in *Table 3-1*. There are five LEDs, which are PWR, DTE, SHDSL, ALM and TST. These five LEDs display the system status.

Ethernet RJ-45 Pin Assignment



Pin	Description
1	TX+
2	TX-
3	RX+
4	NC
5	NC
6	RX-
7	NC
8	NC

Table 3-1 Indicators on Front Panel

LED	*Description*	*Color*	*Off*	*Flashing 0,5 sec*	*Always On*
PWR	Power	Green	No Power	N/A	Power OK
SHDSL	Loop	Green	Failure	Handshaking/Training	Connecting
		Red		N/A	Idle
DTE	Data/E1/T1	Green	Unequipped or Failure	N/A	Traffic OK
		Red		N/A	LOS
ALM	Alarm	Red	Normal	Major Alarm	Minor Alarm
TST	Testing	Yellow	Normal	N/A	Loopback activated

Test Buttons

The test buttons of SCORPIO 1400 are depicted in *Table 3-2*. There are four keys, including LL, RL, LPB and RPB. By pressing these test buttons, users may perform loopback testing for diagnostic purpose.

Table 3-2 Test Buttons on Front Panel

Test Buttons	*Description*
LL	Local Loop Back
RL	Remote Loop Back
LPL	Local Payload Loop Back
RPL	Remote Payload Loop Back

Rear Panel

Figure 3-2 illustrates the rear panel of the SCORPIO 1400. Users may connect the SCORPIO 1400 to other devices or equipments via these interfaces.

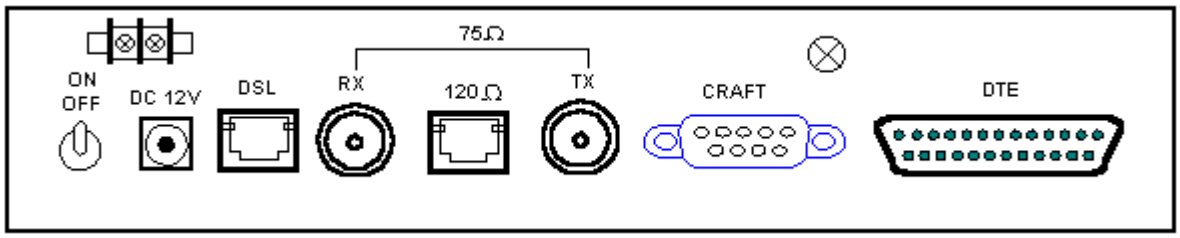
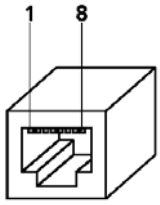


Figure 3-2 **Rear Panel of the SCORPIO 1400**

The following connectors / devices appear on the rear panel of the SCORPIO 1400.

- Power On / Off : The SCORPIO 1400's power switch
- Power Receptacle : Power plug for a power adaptor
- Ground Terminal : Ground output terminal, connect to earth.
- DSL Jack : RJ-45 jack for SHDSL link
- Craft Interface : 9 pin female serial D-sub connector
- Data Interface : Data terminal equipment port
- E1 / T1 Interface : E1 G.703 / G.704 balanced / balanced interface and T1 interface

G.SHDSL RJ-45 Pin Assignment



Pin	Description
1	-
2	-
3	-
4	Tip
5	Ting
6	-
7	-
8	-

The SCORPIO 1400 supports various DTE (Data Terminal Equipment) interfaces depending on user requirements. Connector types include ITU-T G.703 E1 balanced interface, G.703 E1 unbalanced interface and DB-25 female connector for V.35, X.21, RS-530, and V.36 / RS449 as shown in *Figure 3-3* and *Figure 3-4*.

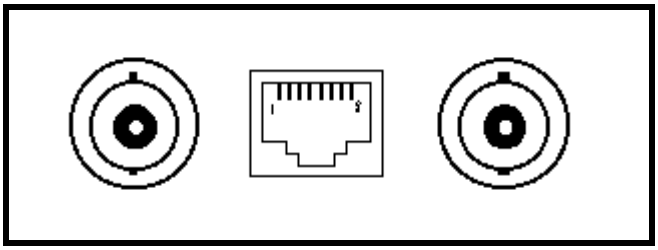
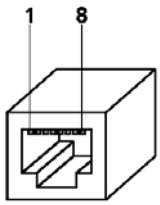


Figure 3-3(a) **BNC for G.703 Unbalanced Interface and RJ45 for Balanced Interface**



Pin	Description
1	TX_tip
2	TX_ring
3	NC
4	Rx_ring
5	Rx_tip
6	NC
7	NC
8	NC

Figure 3-4(b) **Balanced E1 / T1 RJ-45 / 48C Pin Assignment**

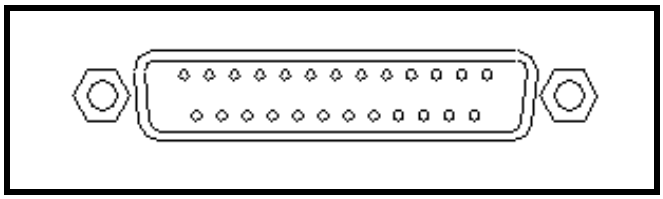


Figure 3-5 **DB-25 for V.35 and RS-530 Interface**

4 INSTALLATION

ABOUT THIS CHAPTER

In this chapter, we will present the installation guide for the SCORPIO 1400. It begins with a checklist for unpacking the shipping package. The chapter continues with the configuration procedures, which cover “Local Loop Back Test” and “Establish Connection”.

Unpacking

The SCORPIO 1400's shipping package includes the following items:

- 1 SCORPIO 1400 standalone unit
- 1 User's manual
- 1 Power adapter
- 1 24-AWG RJ-45 cable
- 1 RJ-45 cable box
- Optional items
  - G.703 E1 Balanced / Unbalanced interface
    - 24 AWG RJ-45 cable
    - RJ-45 cable box
  - ITU-T V.35 / RS530 / X.21 n x 64Kbps interface
    - V.35 cable
    - X.21 cable
  - 10Base-T interface

Configuration Procedures

This section guides the user through some basic operations on the front panel and makes sure the SCORPIO 1400 unit is correctly configured. These operations include Local Loop back Test and Establish Connection.

Local Loop back Test

1. Turn on the SCORPIO 1400.
2. Press **LL** key
3. Wait for several seconds, the SCORPIO 1400 will complete the test and the TST LED will turn on.

Establish Connection

1. Configure the SCORPIO 1400 CO SIDE (1984 kbps - E1 framer + CRC interface – Int. clock)
2. Configure the SCORPIO 1400 CPE SIDE (1984 kbps - E1 framer + CRC interface – Line clock)
3. Wait for several seconds, SHDSL LED will be ON showing SHDSL link having been established.

5 OPERATION OF CID

ABOUT THIS CHAPTER

In this chapter, you will be introduced to the CID (Craft Interface Device) VT-100 operation of SCORPIO 1400. The chapter starts with an overview of SCORPIO 1400's CID. In addition, each main menu item of the SCORPIO 1400's CID, such as Configuration, Monitor and Software Download, will be discussed.

Overview

When startup the S1400, the following messages will appear before the screen displays the Application software code.

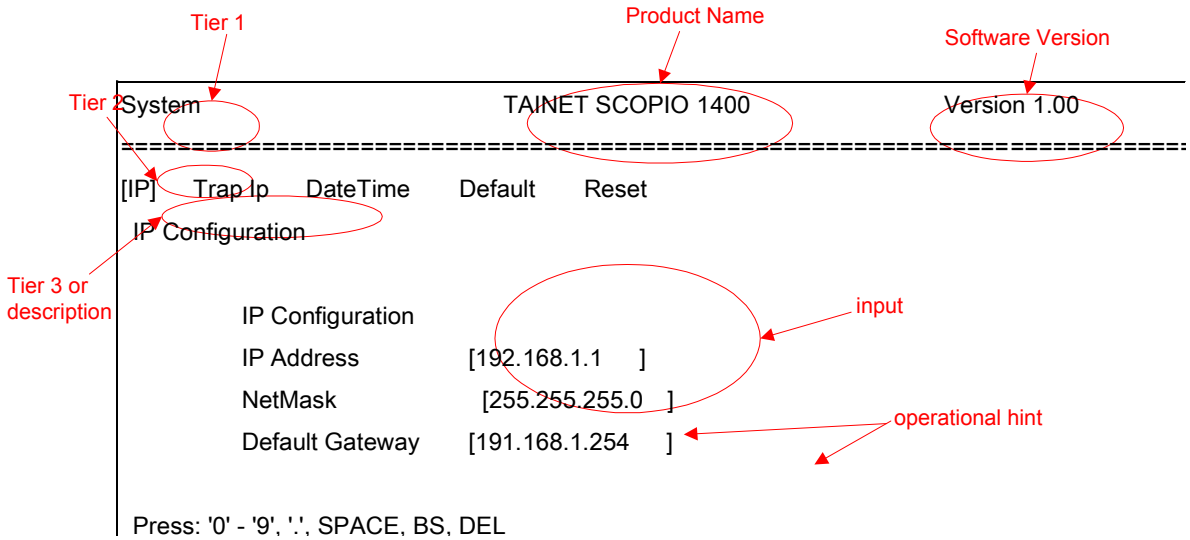
```
RAM test OK!!
Remap Boot (Version=V1.00)
Select 'a' in 1 second-->into Diagnostic mode, or to AP:
caculateCheckSum = 0x1114
szLogo          =TAINET CORP.
szProduct       =Scorpio 1400
szRevision      =V1.00
szFileName      =s1400v100.bin
szFileDate      =2003/01/09 21:06:38
dwCodeSize      =746460
dwCodeCheckSum  =0x44512f4
dwCardType      =1
dwHeaderCheckSum=0x1114
caculateCheckSum = 0x44512f4
code checksum OK
```

At startup of the AP, the CID will prompt user to enter the password for access into the system. The default password is ***admin***.

```
!!! Welcome to Access TAINET SCORPIO 1400 !!!

    Please Enter Password :  *****
```

The CID offers user-friendly menu-driven user interface. The following figure depicts the structure of the interface.



- **Product Name**: TAINET SCORPIO 1400.
- **Software Version**: the software version number.
- **Tier 1**: The top tier of the current screen.
- **Tier 2**: The next tier of the current screen.
- **Tier 3 or description**: The third tier of the current screen and / or its description.
- **Input**: the values to be set by the user.
- **Operational hint**: a hint for the user during operation.

Configuration

After the password checks out, the CID will bring up the top page or the main menu. There are four items on this page, ***System***, ***Interface***, ***Modem***, and ***Security***.

```
MAIN                        TAINET SCORPIO 1400              Version 1.00
================================================================================
[Configuration]   Monitor    Software Download
 System    Interface    Modem    Security




 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

Configuration-System

```
Configuration                TAINET SCORPIO 1400              Version 1.00
================================================================================
[System]   Interface    Modem    Security
 IP    Trap Ip  DateTime    Default    Reset




 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
System                       TAINET SCORPIO 1400              Version 1.00
================================================================================
[IP]   Trap Ip    DateTime    Default    Reset
 IP Configuration

        IP Configuration
        IP Address          [192.168.1.1   ]
        NetMask             [255.255.255.0 ]
        Default Gateway     [191.168.1.254 ]

 Press: '0' - '9', '.', SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

Above step sets the IP address. Setting IP address is required for managing the system via the Ethernet port. This is a must for Telnet and TFTP management.

```
System                          TAINET SCORPIO 1000A                    Version 1.01
=========================================================================
 IP    [Trap IP]    DateTime     Default    Reset
 Trap IP Configuration

          TrapIP Configuration
          Trap IP0 Address        [172.16.5.105    ]
          Trap IP0 Status         [Inactive]
          Trap IP1 Address        [0.0.0.0         ]
          Trap IP1 Status         [Inactive]
          Trap IP2 Address        [0.0.0.0         ]
          Trap IP2 Status         [Inactive]
          Trap IP3 Address        [0.0.0.0         ]
          Trap IP3 Status         [Inactive]
          Trap IP4 Address        [0.0.0.0         ]
          Trap IP4 Status         [Inactive]


 Press: '0' - '9', '.', SPACE, BS, DEL
 TAB,ENTER:next field   '<':left   '>':right   ESC:abort
```

```
System                      TAINET SCORPIO 1400             Version 1.00
=============================================================================
IP   Trap Ip    [DateTime]   Default    Reset
Date and Time Setup

        Date & Time Setup
        Year              [2003 ]
        Month             [1    ]
        Day               [12   ]
        Hour              [16   ]
```

```
        Minute           [27   ]
        Second           [18   ]

Press: '0' - '9', SPACE, BS, DEL
TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **DateTime**: The system provides RTC (Real Time Clock) and supports BCD coded century, year, month, date, day, hours, minutes, and seconds with automatic leap year compensation valid up to the year 2100. Set the Date / Time to correctly time-stamping the alarm or PM data report. The date/time will be stored in non-volatile memory, so data will not be lost even when powering off the system (MPU).
- **Default**: Reset the configuration data of the device to default values.
- **Reset**: Reboot (restart) the device.

Configuration–Interface

```
Configuration              TAINET SCORPIO 1400            Version 1.00
================================================================================
 System   [Interface]   Modem    Security
 SHDSL    T1    E1    DATA



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

There are four DTE interface types, which are ***SHDSL***, ***E1***, ***T1*** and ***DATA***, available for the S1400. In addition, the DATA interface also includes V.35, X.21, V36 / RS499, and RS530.

Configuration–Interface–SHDSL

```
Interface                  TAINET SCORPIO 1400            Version 1.00
[SHDSL]   T1    E1    DATA
 Param    Far End    Near End    Threshold    Clear




 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
SHDSL                      TAINET SCORPIO 1400            Version 1.00
[Param]   Far End    Near End    Threshold    Clear
 Set Power Parameter



                 Port 1
                 Power Backoff   [Enable ]
                 Power Scale     [0    ]
                 PSD             [Sym ]
                 4 Wire          [Off]
                 ANNEX_A_B       [A]

 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **Power Backoff**: When enabled, the transmit power from the other end of STU will be reduced in 1-dB step from 0 to 6dBs according to the received power. The configurable values are *Enable* or *Disable.*
- **Power Scale**: The value of this argument adjusts power in small increments (fractions of a dB) to compensate for minor differences in power between testing units.
- **PSD**: Possible values are *Sym* and *Asym*. Used to let SHDSL transceiver to use a symmetrical or asymmetrical power spectral density mask as specified in G.991.2 standard.
- **4 Wire**: Used to enable or disable 4-wire framing.
- **ANNEX_A_B**: Usedto select the local STU supporting G.991.2 Annex *A* or *B*.

```
SHDSL                      TAINET SCORPIO 1400            Version 1.00
================================================================================
 Param    Far End   [Near End]   Threshold    Clear
 Configure Near End Thresholds



                 SnrMgn Threshold    [0        ]
                 Atn Threshold       [35       ]



 Press: '0' - '9', SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

A TCA (Threshold Crossing Alert) will be reported if the SNR margin is lower, or if the Attenuation is higher than the set value. The TCA will be time-stamped and logged into local memory and in UNMS database.

```
Threshold                  TAINET SCORPIO 1400            Version 1.00
================================================================================
[Near End]   Far End
 Near End of SHDSL



                15-minutes mode
                LOSWS           [60       ]
                ES              [60       ]
                SES             [60       ]
                UAS             [60       ]
                One-day mode
                LOSWS           [300      ]
                ES              [300      ]
                SES             [300      ]
                UAS             [300      ]



 Press: '0' - '9', SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

There are four types of PM parameter thresholds for each combination of near end, far end, 15 minutes, and one day performance monitoring. A TCA will be issued whenever the monitored value has crosses the threshold setting.

```
Clear                      TAINET SCOPRIO 1400            Version 1.00
================================================================================
[Near End]   Far End
 Current Quarter    Current Day    History Quarter    History Day



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

The PM count can be cleared whenever desired.

- **Current Quarter**: The PM parameter count in seconds of the current 15-minute period.

- **Current Day**: The PM parameter count in seconds of current 1-day period.
- **History Quarter**: Stores up to the 96 of the latest 15-minute PM parameter count records.
- **History Day**: Store up to the 7 of the latest one-day PM parameter count records.

Configuration–Interface–T1

```
T1                        TAINET SCORPIO 1400             Version 1.00
================================================================================
[Parameters]   Threshold    Clear
 Near End    Far End



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
Parameters                  TAINET SCORPIO 1400             Version 1.00
================================================================================
[Near End]   Far End
 Configure T1 Near End Parameters



                Configure T1 Parameters
                LineType                [Unframed      ]
                LineCoding              [AMI ]
                Idle Pattern            [0x7f]
                Cable Length            [Short Haul]


 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **LineType**: Possible values are *Framed(ESF)+CRC*, *Framed(ESF)*, *Framed(SF)(D4)* and *Unframed*.
- **LineCoding**: *AMI* or *B8ZS*
- **Idle Pattern:** Sending pattern on the unused time slots. The possible values are *0x7f* and *0xff*.

- **Cable Length**: Possible values are *Short Haul* and *Long Haul*. The T1 circuit provides the function of cable length (from 0 to 200 meters) compensation.

```
Threshold                  TAINET SCORPIO 1400            Version 1.00
================================================================================
[Near End]   Far End
 Near End of T1



                15-minutes mode
                ES              [60       ]
                SES             [60       ]
                UAS             [60       ]
                One-day mode
                ES              [300      ]
                SES             [300      ]
                UAS             [300      ]



 Press: '0' - '9', SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

```
Clear                      TAINET SCORPIO 1400            Version 1.00
================================================================================
[Near End]   Far End
 Current Quarter   Current Day   Quarter History   Day History



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

Configuration–Interface–E1

```
E1                        TAINET SCORPIO 1400             Version 1.00
================================================================================
[Parameters]   Threshold    Clear
 Near End    Far End



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
Parameters                  TAINET SCORPIO 1400             Version 1.00
================================================================================
[Near End]   Far End
 Near End of E1



                Configure E1 Parameters
                LineType                [Framed_CRC   ]
                Impedance               [Balance   ]
                Idle Pattern            [0x7f]

 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **LineType**: Possible values are *Framed_CRC, Framed* (no CRC) and *Unframed*.
- **Impedance**: Nominal 120 ohms resistive symmetrical (*Balance*) pair or 75 ohm asymmetrical (*Unbalance*) pair
- **Idle Pattern:** Bit sending pattern in the unused time slots. The possible values are *0x7f* and *0xff*.

Configuration–Interface–DATA

```
DATA                        TAINET SCORPIO 1400             Version 1.00
================================================================================
[Parameters]
 Near End    Far End



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
Parameters                  TAINET SCORPIO 1400             Version 1.00
================================================================================
[Near End]   Far End
 Near End of DATA



                Configure DATA Parameters
                DTEType                  [V35     ]
                Tx data inversion        [inverse]
                Rx sample edge           [Rising ]

 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **DTEType** : *V35, V36 / RS449, X21,* or *RS530*
- **Tx data inversion** : *normal* or *inverse*. The V.35 interface of STU-R provides data inversion capability used to protect against the occurrence of low pulse density.
- **Rx sample edge**: *Rising* or *Falling*.

Configuration–Modem

Configuration–Modem–Parameters

```
Modem                      TAINET SCORPIO 1400            Version 1.00
================================================================================
[Parameters]  Test   V.54 Test   Timing
 Configure Modem Parameters

        Set Required Modem Type
        Required Modem Type of Near End                [CPE-SHDSL-E1  ]
        Required Modem Type of Far End                 [CO-SHDSL-E1   ]
        Required Modem Data Rate: Input (1~32) *64kbps [31   ]

 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

- **Required Modem Type:** To select the DTE interface type for near-end and far-end. The possible values are listed below:
  - CO-SHDSL-DATA
  - CO-SHDSL-E1
  - CO-SHDSL-T1
  - CPE-SHDSL-DATA
  - CPE-SHDSL-E1
  - CPE-SHDSL-T1.

Configuration-Modem-Test

For test and diagnostic purpose the S1400 system provides various Loopback paths, which are depicted in *Figure 5-1* and *Figure 5-2*. They are Near End (Local Payload) Loopback, Local Loopback, Remote Loopback and Remote Payload Loopback.

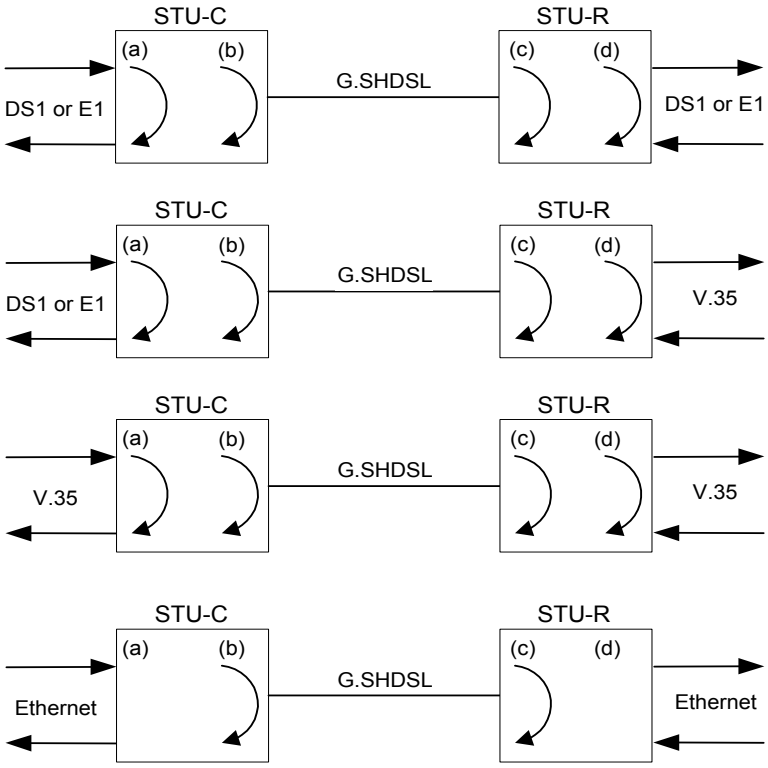


Figure 5-1 **STU-C Side Activated Loopback**

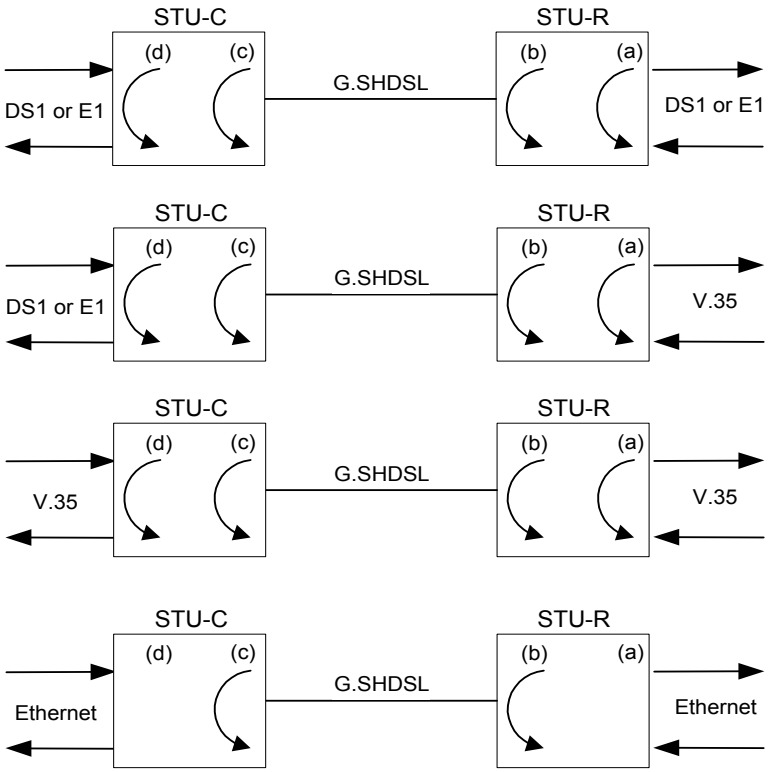


Figure 5-2 **STU-R Side Activated Loopback**

```
Test                        TAINET SCORPIO 1400             Version 1.00
================================================================================
[Loopback]   Pattern test
 Loopback test
                 Loopback Test   [CO Local PayLoad Loopback  ]



 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **Loopback Test**: Possible values are
  - Normal
  - CO Local Loopback
  - CO Local PayLoad Loopback
  - CO Remote Loopback
  - CO Remote PayLoad Loopback
  - CPE Local Loopback
  - CPE Local PayLoad Loopback
  - CPE Remote Loopback
  - CPE Remote PayLoad Loopback

```
Test                        TAINET SCORPIO 1400             Version 1.00
================================================================================
 Loopback   [Pattern test]
 Pattern test
                     Port1
                 Test Patten      [2E11-1]
                 Test Direction   [SHDSL    ]
                 Test Start       [STOP ]



 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **Test Pattern**: Generate test pattern. Possible values are *2E11-1*, *2E15-1*, *QRSS*, *2E20-1* and *2E23-1*.

- **Test Direction:** The direction the pattern is sent to. Possible values are *SHDSL* and *Interface*.
- **Test Start:** To start or stop sending the test pattern. Possible values are *START* and *STOP*.

Configuration-Modem-V.54 Test

In addition to loopback test function described in *Figure 5-1* and *Figure 5-2* the S1000 / S1400 supports V.54 in-band signal to activate and deactivate PLB. The sophisticated addressing capability enables network operator to isolate trouble node by node and from end to end. The procedure and code words comply with ITU-T V.54.

There are various testing methods supported by the S1000 / 1400 as depicted in *Figure 5-3*. Each node in the T1/E1 traffic path has a unique address, which is configured by the system operator, so the node to be looped back can be identified. Testing pattern can be generated after the loopback is activated. The test result can be notified on the CID or UNMS as "V54 Loopback Test (Address 0x03) OK !!" or "V54 Loopback Test (Address 0x03) FAIL !!"

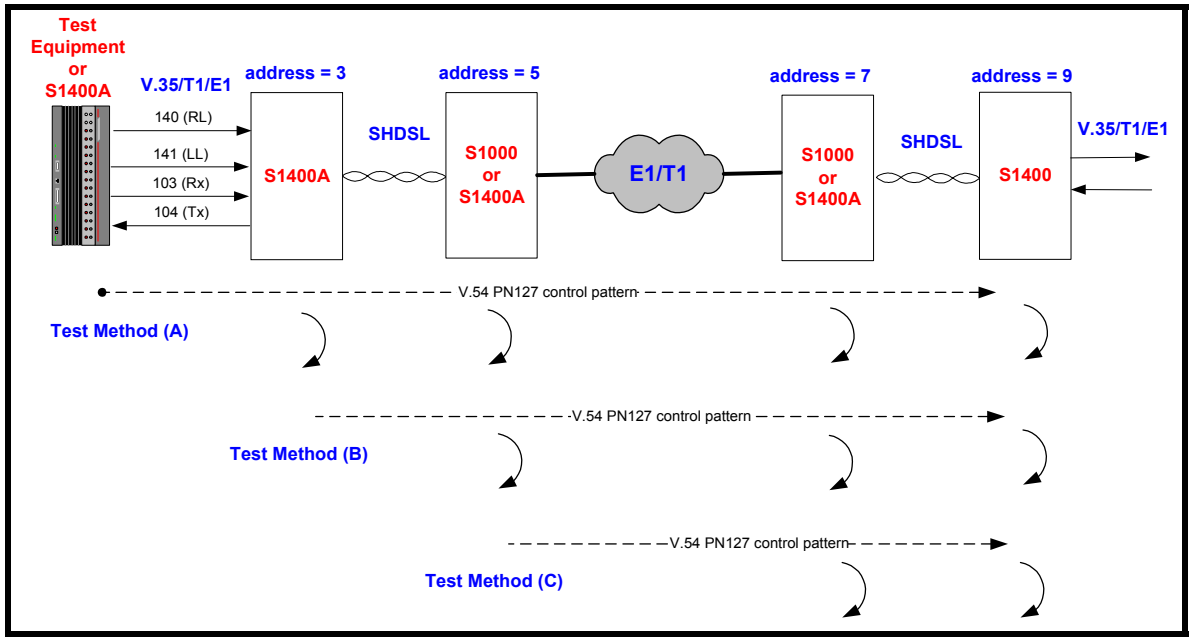


Figure 5-3 **Testing Methods of V.54 Loopback Control**

```
V.54 Test                  TAINET SCORPIO 1400            Version 1.00
================================================================================
[V.54 Parameters]  V.54 Generator
 Configure V.54 Parameters



                V.54 Enable             [Enable ]
                V.54 Address Mode       [Enable ]
                V.54 Near End Address   [0x01]
                V.54 Far End Address    [0x03]



 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

```
V.54 Test                  TAINET SCORPIO 1400            Version 1.00
================================================================================
 V.54 Parameters  [V.54 Generator]
 V.54 Start/Stop Test



                V.54 Mode        [START V54 LOOPBACK]
                V.54 Direction   [SHDSL    ]
                V.54 Address     [0x03]



 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **V.54 Mode**: *START V54 LOOPBACK* or *STOP V54 LOOPBACK*
- **V.54 Direction**: *SHDSL* or *Interface*
- **V.54 Address**: Possible addresses as defined by standard: *"0x01","0x03","0x05","0x07","0x09","0x0B","0x0D","0x0F","0x11", "0x13","0x15","0x17","0x19","0x1B","0x1D","0x1F","0x25","0x27", "0x2B","0x2D","0x2F","0x33","0x35","0x37","0x3B","0x3D", "0x3F","0x55","0x57","0x5B","0x5F","0x6F","0x77","0x7F"*

Configuration-Modem-Timing

```
Modem                      TAINET SCORPIO 1400            Version 1.00
================================================================================
 Parameters   Test   V.54 Test   [Timing]
 Set Timing Source



                Timing Source of Near End   [dte    ]
                Timing Source of Far End    [line   ]



 Press: SPACE to select
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

There are four timing modes that can be selected from: *internal, line, dte, dte-hybrid.*

Configuration-Security

```
Configuration              TAINET SCORPIO 1400            Version 1.00
================================================================================
 System   Interface   Modem   [Security]
 Security Configuration


        Console Port Password   [admin   ]
        Telnet Username         [admin   ]
        Telnet Password         [admin   ]


 Press: ASCII, SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

Monitor

```
Monitor                        TAINET SCORPIO 1400              Version 1.00
================================================================================
[Alarm]   Interface
 Alarm   Alarm Log    Clear alarm Log




 SPACE:refresh page  '<':page up  '>':page down  ESC:abort
```

Monitor-Alarm

```
Alarm                          TAINET SCORPIO 1400              Version 1.00
================================================================================
[Alarm]   Alarm Log    Clear Alarm Log
 View Real Time Alarm

   TYPE                   Class

1   DSX1_LOS                MAJOR
2   SHDSL_LOSW              MAJOR

 SPACE:refresh page  '<':page up  '>':page down  ESC:abort
```

- Alarm severity class: *Major*, *Minor*, *Warning* or *Clear*

All TCA (Threshold Crossing Alert) are classified as WARNING. *Table 5-1* and *Table 5-2* show all SHDSL alarms and T1/E1 alarms, respectively.

Table 5-1 SHDSL Alarms Description

Alarm Type	*Severity Class*	*Description*
SHDSL_LOSW	MAJOR	Failure of LOSW
SHDSL_LOSWS_QTR_TRHD	WARNING	15-minute LOSW TCA
SHDSL_LOSWS_DAY_TRHD	WARNING	1-day LOSW TCA
SHDSL_ES_QTR_TRHD	WARNING	15-minute ES TCA
SHDSL_ES_DAY_TRHD	WARNING	1-day ES TCA
SHDSL_SES_QTR_TRHD	WARNING	15-minute SES TCA
SHDSL_SES_DAY_TRHD	WARNING	1-day SES TCA
SHDSL_UAS_QTR_TRHD	WARNING	15-minute UAS TCA
SHDSL_UAS_DAY_TRHD	WARNING	1-day UAS TCA
SHDSL_LOSWS_FE_QTR_TRHD	WARNING	15-minute FE LOSW TCA
SHDSL_LOSWS_FE_DAY_TRHD	WARNING	1-day FE LOSW TCA
SHDSL_ES_FE_QTR_TRHD	WARNING	15-minute FE ES TCA
SHDSL_ES_FE_DAY_TRHD	WARNING	1-day FE ES TCA
SHDSL_SES_FE_QTR_TRHD	WARNING	15-minute FE SES TCA
SHDSL_SES_FE_DAY_TRHD	WARNING	1-day FE SES TCA
SHDSL_UAS_FE_QTR_TRHD	WARNING	15-minute FE UAS TCA
SHDSL_UAS_FE_DAY_TRHD	WARNING	1-day FE UAS TCA
SHDSL_ATN_TRHD	WARNING	Attenuation TCA
SHDSL_FE_ATN_TRHD	WARNING	FE Attenuation TCA
SHDSL_SNM_TRHD	WARNING	SNR Margin TCA
SHDSL_FE_SNM_TRHD	WARNING	FE SNR Margin TCA

Table 5-2 T1/E1 Alarms Description

Alarm Type	*Severity Class*	*Description*
DSX1_LOS	MAJOR	Failure of LOS
DSX1_LOF	MAJOR	Failure of LOF
DSX1_AIS	MAJOR	Failure of AIS
DSX1_RAI	MINOR	Failure of RAI
DSX1_LOS_FE	MAJOR	Failure of FE LOS
DSX1_LOF_FE	MAJOR	Failure of FE LOF
DSX1_AIS_FE	MAJOR	Failure of FE AIS
DSX1_RAI_FE	MINOR	Failure of FE RAI
DSX1_ES_QTR_TRHD	WARNING	15-minute ES TCA

DSX1_ES_DAY_TRHD	WARNING	1-day ES TCA
DSX1_SES_QTR_TRHD	WARNING	15-minute SES TCA
DSX1_SES_DAY_TRHD	WARNING	1-day SES TCA
DSX1_UAS_QTR_TRHD	WARNING	15-minute UAS TCA
DSX1_UAS_DAY_TRHD	WARNING	1-day UAS TCA
DSX1_ES_FE_QTR_TRHD	WARNING	15-minute FE ES TCA
DSX1_ES_FE_DAY_TRHD	WARNING	1-day FE ES TCA
DSX1_SES_FE_QTR_TRHD	WARNING	15-minute FE SES TCA
DSX1_SES_FE_DAY_TRHD	WARNING	1-day FE SES TCA
DSX1_UAS_FE_QTR_TRHD	WARNING	15-minute FE UAS TCA
DSX1_UAS_FE_DAY_TRHD	WARNING	1-day FE UAS TCA

```
Alarm                      TAINET SCORPIO 1400            Version 1.00
================================================================================
 Alarm   [Alarm Log]
 View Alarm Log

    TYPE                  PortNO.  Class    Status  Date        Time

1   DSX1_UAS_QTR_TRHD       PORT1    WARNING  RAISED  01/12/2003   16:46:00
2   SHDSL_UAS_QTR_TRHD      PORT1    WARNING  RAISED  01/12/2003   16:46:00
3   SHDSL_LOSWS_QTR_TRHD    PORT1    WARNING  RAISED  01/12/2003   16:46:00
4   DSX1_UAS_QTR_TRHD       PORT1    WARNING  CLR     01/12/2003   16:45:00
5   SHDSL_UAS_QTR_TRHD      PORT1    WARNING  CLR     01/12/2003   16:45:00
6   SHDSL_LOSWS_QTR_TRHD    PORT1    WARNING  CLR     01/12/2003   16:45:00
7   DSX1_UAS_QTR_TRHD       PORT1    WARNING  RAISED  01/12/2003   16:31:00
8   SHDSL_UAS_QTR_TRHD      PORT1    WARNING  RAISED  01/12/2003   16:31:00
9   SHDSL_LOSWS_QTR_TRHD    PORT1    WARNING  RAISED  01/12/2003   16:31:00
10  DSX1_UAS_QTR_TRHD       PORT1    WARNING  CLR     01/12/2003   16:30:00
11  SHDSL_UAS_QTR_TRHD      PORT1    WARNING  CLR     01/12/2003   16:30:00
12  SHDSL_LOSWS_QTR_TRHD    PORT1    WARNING  CLR     01/12/2003   16:30:00

 SPACE:refresh page  '<':page up  '>':page down  ESC:abort
```

Up to 200 alarm records can be stored without the use UNMS. Many more can be logged in Database if UNMS is used.

Monitor-Interface

```
Interface                    TAINET SCORPIO 1400              Version 1.00
================================================================================
[SHDSL]   T1    E1
 Common    Far End    Near End    Performance



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

Monitor-Interface-SHDSL

```
SHDSL                        TAINET SCORPIO 1400              Version 1.00
================================================================================
[Common]   Far End    Near End    Performance
 View Commom Status



                 PORT1
                 Line Status       Handshaking
                 Power Backoff     Enable
                 Power Scale       0
                 PSD               Sym
                 4 Wire            Off
                 ANNEX             A


 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

- **Line Status:** The possible SHDSL operational states are *"Idle_State"*, *"Handshaking"*, *"Training"*, *"Framer_syn"*, *"Connect"*, *"Disconnect"*, *"Analog_Loopback"*, *"Remote_Digital_Loopback"*, *"Digital_Loopback"*, *"Analog_Loopback_fail"*, *"Remote_Digital_Loopback_fail"*, *"Digital_Loopback_fail"*, *"Port_disable"*, *"Port_Has_Been_Reset"*, *"Unknown_State"*.

Please refer to Section *Configuration-Interface-SHDSL* for the other parameters.

```
SHDSL                        TAINET SCORPIO 1400              Version 1.00
================================================================================
 Common    Far End   [Near End]   Performance
 View Near End Line Status

                 Current Atn             0
                 Current Snr Margin      15
                 Current Output Power    7
                 Receiver Gain           7

 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

```
Performance                  TAINET SCORPIO 1400              Version 1.00
================================================================================
[Current 15Min]   Current Day    Last 96 Quarters    Last 7 Days
 Near End    Far End



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

```
Last 96 Quarters            TAINET SCORPIO 1400            Version 1.00
================================================================================
[Near End]   Far End
 View History of 15min Records

    PortNO  ES         SES        UAS        LOSW

1   PORT1   0          0          900         900
2   PORT1   0          0          900         900
3   PORT1   0          0          900         900
4   PORT1   0          0          900         900
5   PORT1   0          0          900         900
6   PORT1   0          0          900         900
7   PORT1   0          0          900         900
8   PORT1   0          0          900         900
9   PORT1   0          0          900         900
10  PORT1   0          0          588         588
11  PORT1   0          0          0           0
12  PORT1   0          0          0           0
```

Monitor-Interface-T1

```
T1                          TAINET SCORPIO 1400            Version 1.00
================================================================================
[Performance]
 Current 15Min    Current Day    Last 96 Quarters    Last 7 Days



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

Monitor-Interface-E1

```
E1                          TAINET SCORPIO 1400            Version 1.00
================================================================================
[Performance]
 Current 15Min    Current Day    Last 96 Quarters    Last 7 Days



 ENTER:select  TAB:next  '<':left  '>':right  ESC:previous menu
```

Monitor-Modem

```
Modem                      TAINET SCORPIO 1400            Version 1.00
================================================================================
[Version Info]   Modem Status    Led Status
 Version Information

                 Main Hardware Version   0.02
                 Software Version        1.00
                 FPGA Version            2.01

 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

```
Modem                      TAINET SCORPIO 1400            Version 1.00
================================================================================
 Version Info   [Modem Status]   Led Status
 Modem Status

                  Actual Near End Modem Type    CPE-SHDSL-T1
                  Actual Far End Modem Type     CO-SHDSL-T1
                  Near End Timing Source        dte
                  Far End Timing Source         line
                  Data Rate                     1544

 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

```
Modem                      TAINET SCORPIO 1400            Version 1.00
================================================================================
 Version Info    Modem Status   [Led Status]
 Led Status

                  LED Status: DSL     Green-Flash
                  LED Status: DTE     Red
                  LED Status: ALARM   Red-Flash
                  LED Status: TEST    Inactive

 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

Software Download

```
MAIN                        TAINET SCORPIO 1400              Version 1.00
================================================================================
 Configuration    Monitor   [Software Download]
 Download Software From TFTP Server

                 Server IP Address   [192.168.1.1    ]
                 File Name           [s1400v100.img  ]
                 Start Downloading   [Yes ]

 Press: '0' - '9', '.', SPACE, BS, DEL
 TAB,ENTER:next field  '<':left  '>':right  ESC:abort
```

TFTP software upgrade is supported.

A ORDERING INFORMATION

Table A-1 is the order information for your reference.

Table A-1 Order Information

Product Code	*Ordering No.*	*Description*

B VT-100 MENU TREE

The menu tree of VT-100 is shown in *Table B-1*. The default value of each parameter is also listed for users' reference.

Table B-1 VT-100 Menu Tree

Tier 1 / Tier 2	*Tier 3*	*Tier 4*	*Tier 5*	*Tier 6*	*Tier 7*	*Default Value*
Configuration /System	IP	(IP Address)				**192.168.1.1**
		(net Mask)				**255.255.255.0**
		(defult GW)				**192.168.1.254**
	Trap Ip	TrapIpaddress				**210.65.231.120**
		TrapIpStatus				**Inactive**
	Date Time	(Date Time)				**2002/01/01 00:00:00**
	Default					**X**
	Reset					**X**
Configuration /Interface	SHDSL	Parameter	(Power Backoff)			**Enable, disable**
			(Power Scale)			**0**
			(PSD)			**Sym,Asym**
			(4 WIRE)			**On, Off**
			(ANNEX_A_B)			**A,B**
		Far End	(SnrMgn Threshold)			**0**
			(Atn Threshold)			**35db**

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
		Near End	(SnrMgn Threshold)			**0**
			(Atn Threshold)			**35db**
		Threshold	Near End	(LOSW)	<mode>	**Mode:15min 60** **Mode:day 300**
				(ES)		**Mode: 15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
			Far End	(LOSW)		**Mode:15min 60** **Mode:day 300**
				(ES)		**Mode:15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
		Clear	Near End	Current Quarter		**x**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
			Far End	Current Quarter		**x**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
	T1	parameter	Near End	(Line Type)		**Unframed** **Framed (ESF) + CRC** **Framed (noCRC)** **Framed (SF) (D4)**
				(Line Coding)		**AMI,B8ZS**
				(Idle Patten)		**0xff**

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
				(Cable Length)		**Short haul**
			Far End	(Line Type)		**Unframed** **Framed (ESF) + CRC** **Framed (noCRC)** **Framed (SF) (D4)**
				(Line Coding)		**AMI, B8ZS**
				(Idle Patten)		**0xff**
				(Cable Length)		**Short haul**
		Threshold	Near End	(ES)		**Mode: 15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
			Far End	(ES)		**Mode:15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
		Clear	Near End	Current Quarter		**x**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
			Far End	Current Quarter		**x**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
	E1	parameter	Near End	(Line Type)		**Unframed** **Framed_CRC** **Framed (no CRC)**

Tier 1 / Tier 2	*Tier 3*	*Tier 4*	*Tier 5*	*Tier 6*	*Tier 7*	*Default Value*
				(IDLE PATTEN)		**0xff,0x7f**
				(Impedance)		**Unbalance** **Balance**
			Far End	(Line Type)		**Unframed** **Framed_CRC** **Framed (no CRC)**
				(IDLE PATTEN)		**0xff,0x7f**
				(Impedance)		**Unbalance** **Balance**
		Threshold	Near End	(ES)	<slot>	**Mode: 15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
			Far End	(ES)	<slot>	**Mode: 15min 60** **Mode: day 300**
				(SES)		**Mode: 15min 60** **Mode: day 300**
				(UAS)		**Mode: 15min 60** **Mode: day 300**
		Clear	Near End	Current Quarter		**<slot, port>**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
			Far End	Current Quarter		**x**
				Current Day		**x**
				History Quarter		**x**
				History Day		**x**
	DATA	Parameters	Near End	(DTE Type) <slot, port>		**V35 V36/RS449 RS530 X21**
				(Tx data inversion)		**Normal Inverter**
				(Rx sample edge)		**Rising Falling**

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
			Far End	(DTE Type) <slot, port>		**V35 V36/RS449 RS530 X21**
				(Tx data inversion)		**Normal Inverter**
				(Rx sample edge)		**Rising Falling**
Configuration /Modem	Parameter	(Required Modem Type of Near End)				**Empty**
		(Required Modem Type of Far End)				**Empty**
		(Required Modem Data Rate)				**2048K**
	Test	loopback				**Normal** **Local Loopback** **Local PayLoad Loopback** **Remote Loopback** **Remote PayLoad Loopback** **CPE Local Loopback** **CPE Local PayLoad Loopback** **CPE Remote Loopback** **CPE Remote PayLoad Loopback**
		Patten Test	(Patten)			**2e11-1**
			(Direction)			**Shdsl**
			(Start)			**Stop**
	V54 Test	V54 Parameters	(V54 Enable)			**Disable**
			(V.54 address mode)			**Disable**
			(V.54 Near End Address)			**0x03**

Tier 1 / Tier 2	*Tier 3*	*Tier 4*	*Tier 5*	*Tier 6*	*Tier 7*	*Default Value*
			(V.54 Far End Address)			**0x01**
		V54 Generator	(V54 Mode)			
			(V.54 Direction)			
			(V.54 Address)			
	Timing	(Time source of Near End)				**<line, internal, dte, dte-hybrid>**
		(Timer source of Far End)				**<line, internal, dte, dte-hybrid>**
Configuration /Security	(Console: Password) (Telnet: User Name, Password)					**<"admin">** **<"admin", "admin">**
Monitor /Alarm	Alarm					
	AlarmLog					
	Clean Alarm Log					**X**
Monitor /Interface	T1	Performance	Current 15Min	NearEnd	(TimeElapsed)	
					(ES)	
					(SES)	
					(UAS)	
				FarEnd	(TimeElapsed)	
					(ES)	
					(SES)	
					(UAS)	
			Current Day	Near End	(Time Elapsed)	
					(ES)	
					(SES)	
					(UAS)	
				Far End	(Time Elapsed)	
					(ES)	
					(SES)	

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
					(UAS)	
			Last 96 Quarters	Near End	(ES)	
					(SES)	
					(UAS)	
				Far End	(ES)	
					(SES)	
					(UAS)	
			Last 7 day	Near End	(ES)	
					(SES)	
					(UAS)	
				Far End	(ES)	
					(SES)	
					(UAS)	
	E1	Performanc e	Current 15 Min	Near End	(TimeElaps ed)	
					(ES)	
					(SES)	
					(UAS)	
				Far End	(TimeElaps ed)	
					(ES)	
					(SES)	
					(UAS)	
			Current Day	Near End	(Time Elapsed)	
					(ES)	
					(SES)	
					(UAS)	
				Far End	(Time Elapsed)	
					(ES)	
					(SES)	
					(UAS)	
			Last 96 Quarters	Near End	(ES)	
					(SES)	
					(UAS)	
				Far End	(ES)	

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
					(SES)	
					(UAS)	
			Last 7 Day	Near End	(ES)	
					(SES)	
					(UAS)	
				Far End	(ES)	
					(SES)	
					(UAS)	
	SHDSL	Common	(LineStatus)			
			(PowerBackoff)			
			(PowerScale)			
			(PSD)			
			(4 WIRE)			
			(ANNEX_A_B)			
		Far End	(Current Atn)			
			(CurrentSnrMgn)			
			(CurrentOutputPower)			
			(ReceiverGain)			
		Near End	(CurrentAtn)			
			(CurrentSnrMgn)			
			(CurrentOutputPower)			
			(ReceiverGain)			
		Performance	Current 15Min	Near End	(TimeElapsed)	
					(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
				Far End	(TimeElapsed)	
					(ES)	

Tier 1 / Tier 2	Tier 3	Tier 4	Tier 5	Tier 6	Tier 7	Default Value
					(SES)	
					(UAS)	
					(LOSW)	
			Current Day	Near End	(TimeElapsed)	
					(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
				Far End	(TimeElapsed)	
					(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
			Last 96 Quarters	Near End	(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
				Far End	(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
			Last 7 Day	Near End	(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
				Far End	(ES)	
					(SES)	
					(UAS)	
					(LOSW)	
Monitor /Modem	Version Info	(main Hw Version)				
		(Sw Version)				
		(fpga Version)				

Tier 1 / Tier 2	*Tier 3*	*Tier 4*	*Tier 5*	*Tier 6*	*Tier 7*	*Default Value*
	modem Status	(Actual Near End modem Type)				
		(Actual Far End Modem Type)				
		(Near End Timing Source)				
		(Far End timing Source)				
		(Data Rate)				
	Led Status	(DSL)				
		(DTE)				
		(ALARM)				
		(TEST)				
Software Download /(Sever IP address)						**0.0.0.0**
Software Download /(File name)						
Software Download /(Start downloading)						

C PINS ASSIGNMENT

The pin assignment for different interface of SCORPIO 1400 is depicted in the following sections.

A Conversion Cable is enclosed for converting DB-25 to V.35, V.36, or X.21 interface, as shown in *Figure C-1*.

There are three types of Conversion Cables, depending on the customer's order; the cable is enclosed in the shipping package.

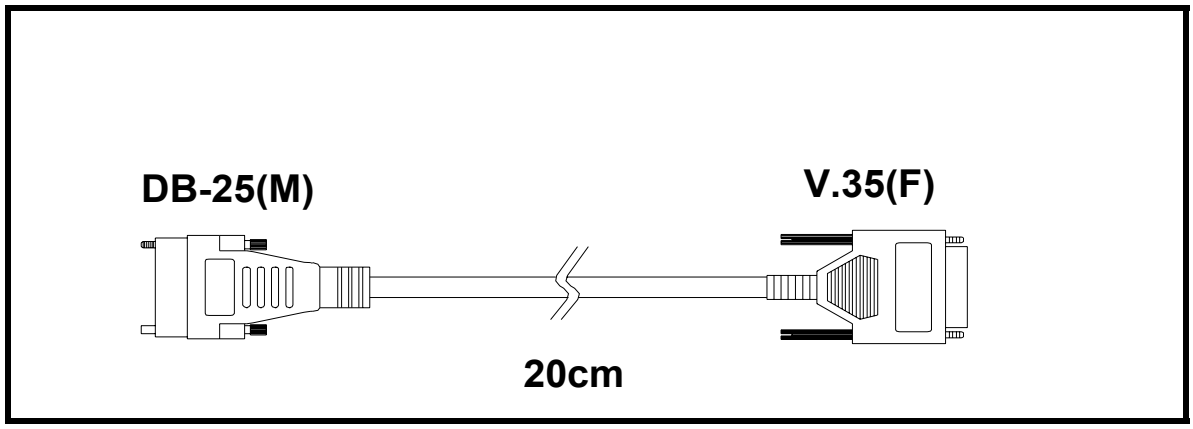


Figure C-1 **The Conversion Cable of DB-25(M) to V.35(F)**

V.35 Interface

Figure C-2 and *Figure C-3* respectively illustrate the DB-25M and V.35 interfaces. Refer to *Table C-1* to see the pin definition of V.35 cable.

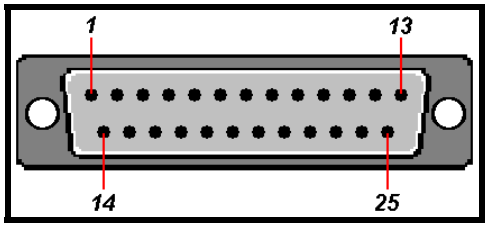


Figure C-2 **DB-25M Interface**

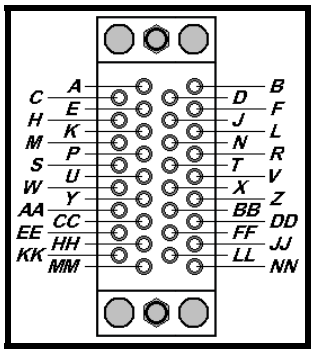


Figure C-3 **V.35 Interface**

Table C-1 **V.35 Cable Pin Definition**

DB-25 Male	*Signal*	*V.35 Female*	*Source*
1	Frame Ground	A	Common
7	Signal Ground	B	Common
4	Request to Send	C	DTE
5	Clear to Send	D	DCE
6	Data Set Ready	E	DCE
8	Data Carrier Detect	F	DCE
20	Data Terminal Ready	H	DTE
2	Transmit Data (A)	P	DTE
3	Receive Data (A)	R	DCE
14	Transmit Data (B)	S	DTE
16	Receive Data (B)	T	DCE
24	Terminal Timing (A)	U	DTE
17	Receive Timing (A)	V	DCE
11	Terminal Timing (B)	W	DTE
9	Receive Timing (B)	X	DCE
15	Terminal Timing (A)	Y	DCE
12	Terminal Timing (B)	AA	DCE

RS-530 Interface

Figure C-4 illustrates the RS-530 Interface.

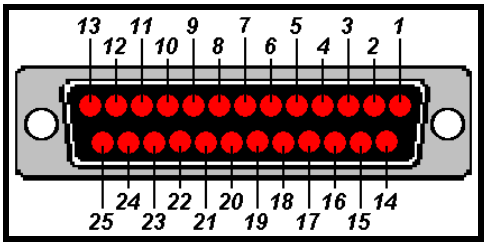


Figure C-4 **RS-530 Interface**

Refer to *Table C-2* to see the pin definition of RS-530 Connector.

Table C-2 **RS-530 Connector Pin Definition**

DB-25 Male	*Signal*	*Source*
1	Frame Ground	Common
2	Transmit Data (A)	DTE
3	Receive Data (A)	DCE
4	Request to Send (A)	DTE
5	Clear to Send (A)	DCE
6	DCE Ready (A)	DCE
7	Signal Ground	Common
8	Receive line Signal Detector (A)	DCE
9	Receive Signal Element Timing (B)	DCE
10	Receive line Signal Detector (B)	DCE
11	EXT. Transmit Signal Element Timing (B)	DTE
12	Transmit Signal Element Timing (B)	DCE
13	Clear to Send (B)	DCE
14	Transmit Data (B)	DTE
15	Transmit Signal Element Timing (A)	DCE
16	Receive Data (B)	DCE
17	Receive Signal Element Timing (A)	DCE
18		
19	Request to Send (B)	DTE
20	DTE Ready (A)	DTE
21		
22	DCE Ready (B)	DCE
23	DTE Ready (B)	DTE
24	EXT. Transmit Signal Element Timing (A)	DTE

V.36/RS-449 Interface

The DB-37F interface is shown in *Figure C-5*.

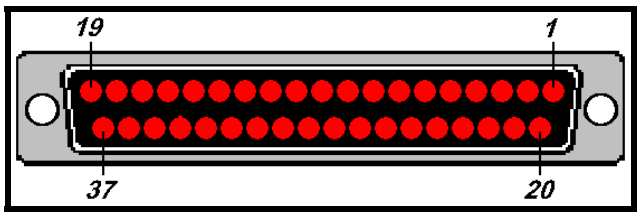


Figure C-5 **DB-37F Interface**

Refer to *Table C-3* to see the pin definition of V.36/RS-449 cable.

Table C-3 **V.36/RS-449 Cable Pin Definition**

DB-25 Male	*Signal*	*V.36/RS-449 Female*	*Source*
1	Shield	1	Common
2	Send Data (A)	4	DTE
15	Send Timing (A)	5	DCE
3	Receive Data (A)	6	DCE
4	Request to Send (A)	7	DTE
17	Receive Timing (A)	8	DCE
5	Clear to Send (A)	9	DCE
6	Data Mode (A)	11	DCE
20	Terminal ready (A)	12	DTE
8	Receive Ready (A)	13	DCE
24	Terminal Timing (A)	17	DTE
7	Signal Ground	19,20,37	Common
14	Send Data (B)	22	DTE
12	Send Timing (B)	23	DCE
16	Receive Data (B)	24	DCE
19	Request to Send (B)	25	DTE
9	Receive Timing (B)	26	DCE
13	Clear to Send (B)	27	DCE
22	Data Mode (B)	29	DCE
23	Terminal Ready (B)	30	DTE
10	Receive Ready (B)	31	DCE
11	Terminal Timing (B)	35	DTE

X.21 Interface

Figure C-6 illustrates the X.21 Interface. For the DB-25 interface, refer to *Figure C-2*.

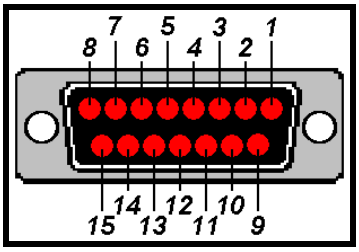


Figure C-6 **X.21 Interface**

Refer to *Table C-4* to see the pin definition of V.36/RS-449 cable.

Table C-4 **X.21 Cable Pin Definition**

DB25 Male	*Signal*	*X.21 Female*
1	Shield Ground	**1**
2	Signal Ground	**2**
4	TXD(a)	**3**
3	CTRL(a)	**4**
8	RXD(a)	**5**
17	Indication	**6**
24	RXC(a)	**7**
7	Signal Ground	**8**
14	TXD(b)	**9**
19	CTRL(b)	**10**
16	RXD(b)	**11**
10	Indication	**12**
9	RXC(b)	**13**
11	EXC(b)	**14**
G		**G**

DB-9 Interface

The DB-9 connector interface is shown as *Figure C-7*.

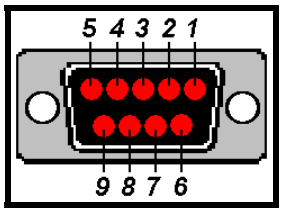


Figure C-7 **DB-9 Interface**

For the pin definition of DB-9 interface, see *Table C-5*.

Table C-5 **DB-9 Connector Pin Definition**

DB9 Female	*Signal*	*Source*
2	TXD	**DCE**
3	RXD	**DTE**
5	Signal Ground	
7	CTS	**DTE**
8	RTS	**DCE**

RJ-45 Interface

Figure C-8 illustrates the RJ-45 interface.

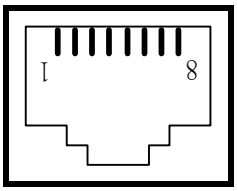


Figure C-8 **RJ-45 Interface**

Refer to *Table C-6*, *Table C-7* and *Table C-8* to see the pin definition of DSL RJ-45 connector, LAN RJ-45 connector and AUX port RJ-45 connector, respectively.

Table C-6 **DSL RJ-45 Connector Pin Definition**

RJ-45	*Signal*
4	Tip
5	Ring

Table C-7 **LAN RJ-45 Connector Pin Definition**

RJ-45	*10Base-T Signal*
1	TxD Twist Pair +
2	TxD Twist Pair -
3	RxD Twist Pair +
6	RxD Twist Pair -

Table C-8 **G703 Balance port RJ-45 / 48C Connector Pin definition**

RJ-45	*AUX port description*
1	TxD Twist Pair +
2	TxD Twist Pair -
3	
4	RxD Twist Pair +
5	RxD Twist Pair -
6	
7	
8	

D TROUBLE SHOOTING

Trouble Shooting Table		
1	Configured parameter values are lost after equipment restart	
	When user modifies or changes the parameters, the user should save the configurations in the flash memory by entering the "**Save Configuration"** menu, and then reboot the system by entering the "**Reboot"** menu.	
2	Console / Telnet / Web User Name and Password	
	When accessing the device through Telnet or the Web, the user will be prompted to enter the password. User can try the default user name "**admin**" and password "**12345678**" to log in.	
3	Access denied	
	There are several conditions that will disable user's access to the device via Console, Telnet or the Web.	
	Message	Solution
	Incorrect user	The password entered is incorrect. Check the user name and password again.

E TROUBLE REPROT

Company	
Local Representation	
Purchase Order No	
Equipment Serial No	
Software Version	

Please describe: 1. Testing Network Structure 2. Configuration
3. Testing Network Equipment 4. Trouble Description

E-MAIL:	
TEL:	FAX:
Signature:	Date: / /

TAINET COMMUNICATION SYSTEM CORP. FAX: 886-2-2658-3232
E-MAIL: *sales@tainet.net*

F GLOSSARY

KEYWORD	*EXPLAINATION*
10 Base-T	Part of the original IEEE 802.3 standard, 10 Base-T is the Ethernet specification of 10Mbps base-band that uses two pair of twisted-pair, Category 3,4 or 5 cabling- using one pair to send data and the other to receive. 10 Base-T has a distant limit of about 100 meters per segment.
100 Base-T	Based on the IEEE 802.3u standard, 100BaseT is the Fast Ethernet specification of 100Mbps base-band that uses UTP wiring. 100BaseT sends link pulse over the network when no traffic is present.
Address Mask	The address mask for an IP address is used to identify the boundary between the network portion of the address and host portion.
ADSL	Asymmetric Digital Subscriber Line: An evolving high-speed transmission technology originally developed by Bell-core and mow standardized by ANSI as T1.413. A、 Uses existing UTP copper wires from Telephone Company's central office to subscriber's premises. B、 Involves electronic equipment in the form of ADSL modems at central office and subscriber's premises. C、 Sends digital signal up and down these copper wires and sends more information one way than the other- hence the term "asymmetric".

KEYWORD	EXPLAINATION
ARP	Address Resolution Protocol is a method to find a host's physical address from its IP address. An ARP request is sent to the network, naming the IP address, then machine with that IP address returns its physical address so it can receive the transmission.
ATM	Asynchronous Transfer Mode. International standard for cell relay in which multiple service types (such as voice, video, or data) are conveyed in fixed-length (53-byte) cells. Fixed-length cells allow cell processing to occur in hardware, thereby reducing transit delays. ATM is designed to take advantage of high-speed transmission media such as E3, SONET, and T3.
Authentication	Proof that the information came from the user or location that repeatedly sent it. One example of authenticating software is through digital signature.
Bandwidth	This is the capacity on a link usually measured in bits-per-second (bps).
Bridging	Bridging provides LAN-to-LAN frame forwarding services between two or more LANs. Frames from one LAN are forwarded across a bridge to a connected LAN. Bridging works is similar to the way repeaters work except that bridges forward frame based on their MAC address.
CBR	Constant Bit Rate: An ATM Forum Q-o-S class created for use in ATM network. CBR is used for communications on precision clocking to guarantee trustworthy delivery.
CHAP	Challenge Handshake Authentication Protocol is an alternative protocol that avoids sending password over the wire by using a challenge/response technical.
Class A network	Part of Internet Protocol hierarchical addressing scheme. Class A networks have only 8 bits for defining networks and 24 bits for defining hosts on each network.
Class B network	Part of Internet Protocol hierarchical addressing scheme. Class B networks have only 16 bits for defining networks and 16 bits for defining hosts on each network.
Class C network	Part of Internet Protocol hierarchical addressing scheme. Class C networks have only 24 bits for defining networks and 8 bits for defining hosts on each network.

KEYWORD	*EXPLAINATION*
CLI	Command Line Interface: Allow you to configure TAINET'-s products with maximum flexibility.
CO	Central Office. A CO is a facility that serves local telephone subscribers. In the CO, subscriber's lines are joined to switching equipment that allows them to connect to each other for both local and long distance calls.
CPE	Customer Premise Equipment is privately owned telecommunication equipment at an organization's site that is attached to the telecommunication network. CPE equipment includes routers, modem, PBX, telephones and video communication equipment.
Crossover Ethernet Cable	A cable that wires a pin to its opposite pin, for example RX+ is wired to TX+. This cable connects two similar device, for example, two data terminal equipment (DTE) or data communication equipment (DCE) devices.
DCE	Data Communication Equipment is typically a modem or other type of communication device. The DCE sits between the DET (data terminal equipment) and a transmission circuit such as a phone line.
DHCP	Dynamic Host Configuration Protocol automatically assigns IP address to clients when they log on. DHCP centralizes IP address management on the central computers that run the DHCP server program.
DNS	Domain Name System. A database of domain names and their IP address-e-s. DNS is the primary naming system for many distributed networks, including the internet.
Domain Name	The unique name that identifies an Internet site. Domain Names always have 2 or more parts that are separated by dots. Generally speaking, the part on the left is the most specific and the part on the right is the most general.
DSL	Digital Subscriber Line technologies enhance the data capacity of the existing twisted-pair wire that runs between the local telephone company switching offices and most homes and offices. There are actually seven types of DSL services, ranging in speeds form 16kbits/sec to 52 M bits/sec. The services are either

KEYWORD	EXPLAINATION
	symmetric (traffic flows at the same speed in both directions) or asymmetrical (the downstream capacities higher than the upstream capacities). DSL connections are point-to-point dedicated circuits, which means that they are always connected. There is no dial-up. There is also no switching, which means that the line is a direct connection into the carrier's frame relay, ATM or Internet-connect system.
DSLAM	A Digital Subscriber Line Access Multiple-x-e-r is a network device. Usually at a telephone company central office, that receives signals from multiple customer Digital Subscriber Line connections and puts the signals on the a high-speed backbone line using multiplexing techniques. Depending on the product, DSLAM Multiple-x-e-r connects DSL lines with some combination of asynchronous transfer mode ATM, frame relay or IP networks.
DTE	Originally, Data Terminal Equipment meant Dumb Terminal Equipment. But today it is a computer, bridge or router that interconnects local area network (LAN) in increasingly more intelligent ways.
Dynamic route	Also known as adaptive routing, this technique automatically adapts to traffic or physical network revisions.
Ethernet	A very common method of networking computers in a LAN. There are a number of adaptations to the IEEE 802.3 Ethernet standard, including adaptations with data rates of 10 Mbps and 100 Mbps over coaxial cable, twisted-pair cable and fiber-optical cable.
FTP	File transfer protocol: The TCP/IP protocol used for transmitting files between network nodes, it supports a broad range of file types and is defined in RFC 959.
Gateway	A gateway is a computer system or other device that acts as translator between two systems that do not use the same communication protocols, data formatting structures, languages and/or architecture.
HTTP	Hyper Text Transfer Protocol. The most common protocol used on the Internet HTTP is the primary protocol used for web sites and web browsers. It is also prone to certain kinds of attack.
IGMP	Internet Group Management Protocol: Employed by IP hosts, the

KEYWORD	EXPLAINATION
	protocol that reports their multicast group membership to an adjacent multicast router.
IP	Internet Protocol. The IP (currently IP version 4), is the underlying protocol for routing packets on the Internet and other TCP/IP-based networks.
IP Pool	Internet Protocol Pool refers to the collective group of IP address locates in any particular place.
ISP	Internet Service Provide connections into the Internet for home users and businesses. There are local, regional, national, and global ISPs. You can think of local ISPs as the gatekeepers into Internet.
Jack Type	Different type of jacks (RJ11, RJ45 or RJ 48) can be used for an ISDN line. The RJ11 is the most common in the world and is most often used for analog phones, modems and fax machines. RJ48 and RJ45 are essentially the same, as they both have the same 8-pin configuration. An RJ11 jack can fit into an RJ45 / RJ48 connector, however, an RJ45/RJ48 cannot fit into an RJ11 connector.
LAN	Local Area Network is a shared communication system to which many computers are attached. A LAN, as its mane implies, is limited to a local area. This has to do more with the electrical characteristics of the medium than the fact that many early LANs.
LED	Light Emitting Diode. LED are visual indicators that relay information about the status of specific Scorpio 1401 / 02 functions to user by lighting up, turning off or blinking. LED-slugs are usually found on the front panel of the physical device. Examples include Status, Power and System LEDS.
LLC-Multiplexing	LLC encapsulation allows multiplexing of multiple protocols over a single ATM virtual circuit. By prefixing the PDU (Payload Data Unit) with an IEEE 802.2 Logical Link Control (LLC) header, each protocol can be identified.
Loop-reach	Loop reach defines speed that can be attained at various distances. This is very important for DSL technology as distance from the CO influences attainable speeds.
MAC	On a local area network (LAN) or other network, the Media Access

KEYWORD	*EXPLAINATION*
	Control (MAC) address is your computer's unique hardware number. (On an Ethernet LAN, it is the mane as your Ethernet address). The MAC layer frames data for transmitted as a stream of bits.
Modem	Modulator-demodulator: A device that converts digital signal to analog and vice-versa so that digital information can be transmitted over analog communication facilities, such as voice-grade telephone lines.
Name Resolution	The allocation of an IP address to a host name. See DNS.
NAT	Network Address Translation is the translation of an Internet Protocol address used within one network to a different IP address known within another network. NAPT extends the notion of translation one step further by also translating transport identifier (e.g., TCP and UDP port numbers, ICMP query identifiers). This allows the transport identifiers of a number of private hosts to be multiplexed into the transport identifiers of a single external address. NAPT allows a set of hosts to share a single external address.
Network	Any time you connect 2 or more computers together so that they can share resources, you have a computer network. Connect 2 or more networks together and you have an internet.
Node	Any single computer connected to a network.
PAP	Password Authentication Protocol (PAP) is a security protocol that requires users to enter password before accessing a security system. The user's name and password are sent over the wire to a server there they are compared with a database of user account names and password. This technical is vulnerable to wiretapping (eavesdropping) because the password can be captured and used by someone to log onto the system.
Port	An Internet port refers to a number that is part of a URL, appearing after a colon (:) right after the domain name, Every service on an Internet server listens on a particular port number on that server. Most services have standard port numbers, e.g., Web servers normally listen on port 80.

KEYWORD	*EXPLAINATION*
Port (H/W)	An interface on a computer for connecting peripherals or device to the computer. A printer port, for example, is an interface that is designed to have a printer connected to it. Ports can be defined by specific hardware.
POTS	Plain Old Telephone Service is the analog telephone service that runs over copper twisted-pair wires and is based on the original Bell telephone system. Twisted-pair wires connect homes and businesses to a neighborhood central office. This is called the local loop. The central loop. The central office is connected to other central offices and long-distance facilities.
PPP	Point to point. PPP encapsulates and transmits IP (Internet protocol) data-gram over serial point-to-point links. PPP works with other protocol such as IPX (Internet work Packet Exchange).
RIP	Routing Information Protocol is an interior or intra-domain routing protocol that uses the distance-vector routing algorithms. RIP is used on the Internet and is common in the NetWare environment as a method for exchange routing information between routers.
Router	A device that connects two networks together. Routers monitor, direct and filter information that passes between these networks. Because of their location, routers are a good place to install traffic or mail filter. Routers are also prone to attacks because they contain a great deal of information about a network.
Server	A computer, or a software package, that provides a specific kind of service to client software running on the computers.
SNMP	System Network Management Protocol is a popular management protocol defined by the Internet community for TCP/IP networks. It is a communication protocol for collecting information from device on the network.
Static Routing	Static routers tell the Scorpio routing information that it cannot learn automatically through other means. The need for Static Routing can arise in cases their RIP is disabled on the LAN or a remote network is beyond the one that is directly connected to a remote node.
VC-base multiplexing	Each ATM VC carries PDU-s of exactly one protocol type. When multiple protocols need to be transported, there is a separate VC

KEYWORD	EXPLAINATION
	for each protocol.
WAN	Wide Area Networks link geographically dispersed offices in other cities or around the globe. Just about any long-distance communication medium can serve as a WAN link, including switched and permanent telephone circuits, terrestrial radio systems and satellite system.